

EQUIPMENT PROOF OF PERFORMANCE

Occupied Bandwidth, Spurious and Harmonic Signal
Measurements

For

Radio Translator Station K296GX 107.1 MHz

Lancaster, California

Conducted on February 27, 2017

Measurements Performed by Burt I. Weiner

Burt I. Weiner Associates
210 Allen Avenue
Glendale, California 91201-2804

www.biwa.cc

FOREWORD

This report contains the results of required tests as described in §73.1590 of the Rules and Regulations of the Federal Communications Commission that were conducted on February 27, 2017 on behalf of Radio Station K296GX, which is a translator for KOSS AM-1380, Lancaster, California. K296GX operates on 107.1 MHz with an ERP of 100 Watts from Lancaster, California. The K296GX transmitter is a Nautel model VS300V. The audio processor is an integral part of the transmitter. A Shively 3 section cavity filter, model 2914-3 is installed between the output of the transmitter and the feedline going to the antenna.

These measurements show the extent to which K296GX complies with the occupied bandwidth and harmonic emission requirements of the Commission's rules, specifically, §73.317 regarding: FM Transmission System Requirements.

METHODS AND EQUIPMENT USED

For these tests an Anritsu Spectrum Analyzer model MS2721B was used. A Bird Electronics model 43 wattmeter was inserted between the transmitter output and the 3-section cavity filter. A Bird Electronics Broadband Signal Extractor was inserted into the wattmeter's line section and a 20-foot length of RG-400U was connected between the Signal Extractor and through a 20 dB attenuator to the spectrum analyzer input. For each of the attached spectrographs the analyzer was operated in the peak hold mode for numerous sweeps totaling approximately 10 minutes.

For harmonic measurements a Microwave Filter Company model 5KHP high-pass filter was inserted between the spectrum analyzer's input in order to prevent overload in the analyzer by providing a measured 52.5 dB of attenuation at the fundamental frequency. The insertion loss of the 5KHP filter is less than 2 dB at any frequency between 120 MHz to 1000 MHz. Each of the harmonics were measured and compared to the measured level of the fundamental frequency prior to the insertion of the Hi-Pass filter.

RESULTS

Table A shows the results of the measurements of harmonic and any spurious emissions which were detected and determined to be associated with, but not necessarily attributable to the K296GX broadcast facilities at the time of measurement. Figure 1 shows the Occupied Bandwidth of the modulation mask. The signal shown at 106.3 MHz is a co-located station and is not an intermodulation product.

The Aircraft Radio Spectrum from 118 MHz to 138 MHz was examined for any related spurious signals. None were found.

All emissions attributable to the K296GX broadcast facilities were found to meet the requirements of §73.317(b)(c)(d) of the Commission's Rules and Regulations with the exception of an intermodulation product at 107.9 MHz as shown in Table A.

Qualifications of Engineer

Burt I. Weiner, whose office is located at 210 Allen Avenue Glendale, California, hereby states that he has been actively involved in broadcast engineering since 1957; that his qualifications as a technical consultant are a matter of record with the Federal Communications Commissions; that he has prepared this report for Radio Station K296GX, Lancaster, California; that he made the equipment performance measurements of Radio Station K296GX shown in this report; and that all of the data contained in this report is accurate and correct to the best of his knowledge and ability.

February 27, 2017



Burt I. Weiner

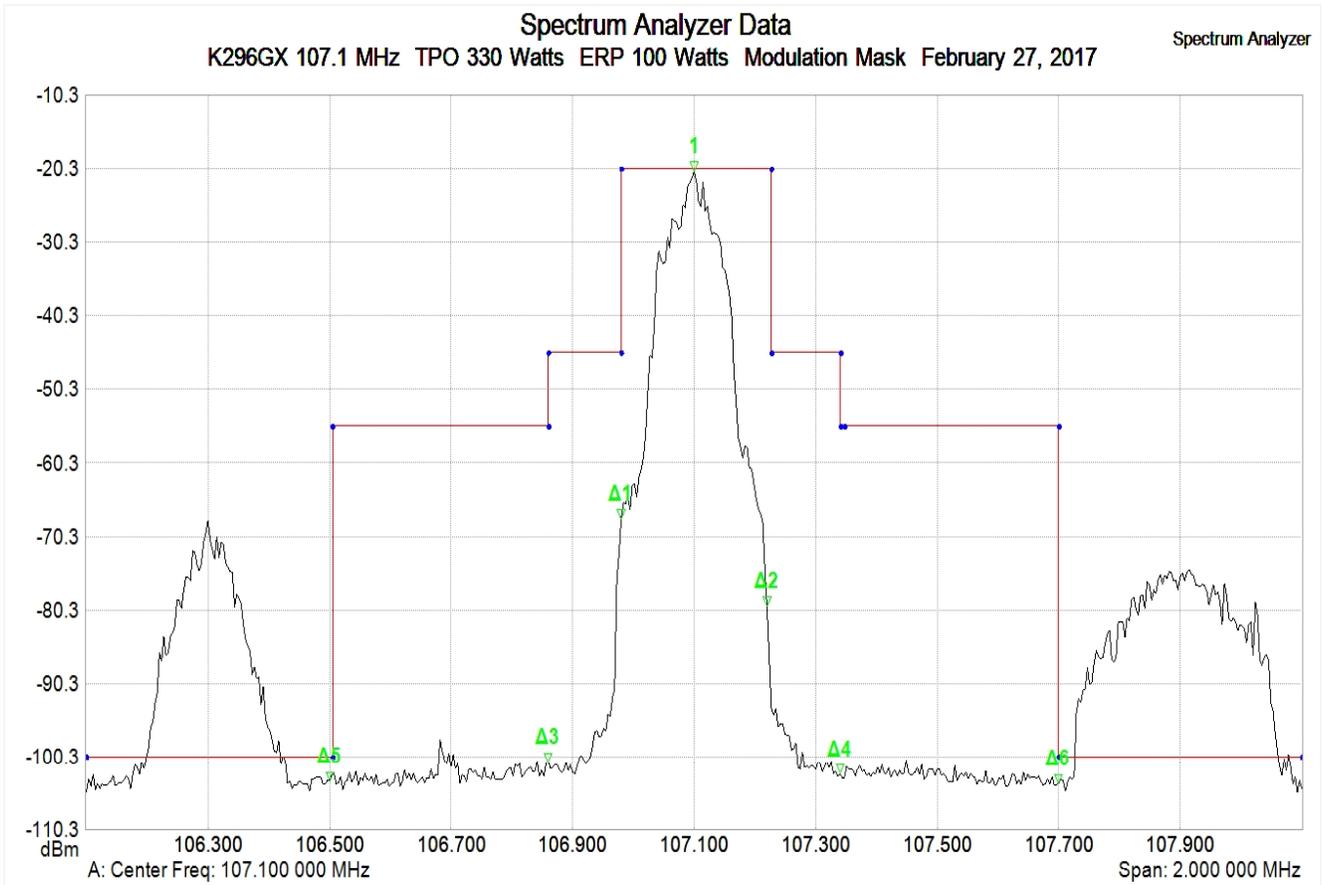
TABLE A

Harmonic and associated emissions relative to the operation of K296GX
February 27, 2017

Frequency and Relationship	Signal Attenuation Relative to Carrier	Attenuation Required by 73.317
107.1 MHz Carrier	0.0 dBc	0.0 dBc
214.2 MHz 2 nd Harmonic	-107.3 dBc	68 dBc
321.3 MHz 3 rd Harmonic	-106.3 dBc	68 dBc
428.4MHz 4 th Harmonic	-109.3 dBc	68 dBc
535.5MHz 5 th Harmonic	-108.6 dBc	68 dBc
642.6 MHz 6 th Harmonic	-107.3 dBc	68 dBc
749.7 MHz 7 th Harmonic	-105.7 dBc	68 dBc
856.8 MHz 8 th Harmonic	-107.1 dBc	68 dBc
963.9 MHz 9 th Harmonic	-109.0 dBc	68 dBc
1071.0 MHz 10 th Harmonic	-108.1 dBc	68 dBc
107.9 MHz Mix w/106.3	-55.1 dBc <u>/1</u>	68 dBc

/1 Exceeds FCC limits by 12.9 dB.

No other related signals were observed.



Mkr	Ref	Delta	Ref Freq	Ref Amp	Delta Freq	Delta Amp
1	■	■	107.099 998 MHz	-20.65 dBm	-120.003 kHz	-47.28 dB
2		■			120.003 kHz	-59.14 dB
3		■			-239.998 kHz	-80.38 dB
4		■			239.998 kHz	-81.98 dB
5		■			-599.998 kHz	-83.04 dB
6		■			599.998 kHz	-83.34 dB

Measurement Parameters

Trace Mode	Max Hold	Frequency Span	2.000 000 MHz
Preamp	OFF	Reference Level	-10.300 dBm
Min Sweep Time	0.001 S	Scale	10.0 dB/div
Reference Level Offset	0 dB	GPS Longitude	W 118 7 33
Input Attenuation	0.0 dB	GPS Latitude	N 34 44 41
RBW	1.0 kHz	GPS Fix Time	02 27 2017 21 55 14
VBW	30.0 kHz	Serial Number	824065
Detection	Peak	Base Ver.	V3.10
Center Frequency	107.100 000 MHz	App Ver.	V4.21
Start Frequency	106.100 000 MHz	Date	2/27/2017 1:55:04 PM
Stop Frequency	108.100 000 MHz	Device Name	Seymour

Figure 1- Modulation Mask

Radio Station K296GX
 Date: February 27, 2017
 Center Frequency: 107.1 MHz
 Span: 2.0 MHz; Vertical: 10dB/Div; RBW: 1 kHz